REMARKS

In reply to the final Office Action dated March 23, 2005, Applicant respectfully requests reconsideration of the above-captioned application. The recitations of claim 2 are proposed to be added to claim 1 and the recitations of claim 14 are proposd to be added to claim 13. In light of these changes, redundant claims 2, 10-12, 14 and 22-24 are proposed to be canceled. Because the combinations of features found in the independent claims have already been examined, entry of these changes is proper.

Applicant notes with appreciation the withdrawal of the rejections based on the Oh et al patent (U.S. Patent 6,734,091) and applicant's description of prior art.

The Office maintains, however, the rejection of claims 1-24 under 35 U.S.C. §103(a) as allegedly being unpatentable over the Rennie patent (U.S. Patent No. 6,057,564) in view of the Okumura patent (U.S. Patent No. 6,370,176). Applicant continues to respectfully traverse this rejection.

In the Response to Arguments section of the final Office Action (pages 4-5), applicant notes that the Office has not mentioned an argument presented in the Amendment of January 3, 2005. Applicant will re-present this argument perhaps in a more compelling fashion.

The Rennie patent discloses in Figures 1a, 1b and 1c the formation of an intermediate layer between a metal electrode and a GaN layer in the form of an oxidized surface of the GaN layer which is affected by HF etching. Specifically, the surface of a GaN layer has a thick oxide layer as a result of metal organic chemical vapor deposition. The thick oxide layer, however, makes metal contact to the surface of the GaN layer have a high operation voltage. Therefore, it is etched by an

HF based etchant. The residual fluorine impurities of HF etchant exists at the surface, however, and becomes "relevant factors in the mechanism of carrier conduction into the GaN layer." See column 6, lines 10-15, 26-27 and 35-38, for instance. In this context, to counteract the effects of the residual fluorine impurities of an HF etchant, a "very thin layer of pure oxide [is] introduced into the surface, and at the same time the F atoms are removed from the surface to obtain a near perfect ohmic contact to the GaN layer according to the first embodiment" as disclosed in the Rennie patent.

It is important to emphasize that the formation of the pure oxide thin layer during a thermal treatment in a dry or wet ambient with low oxygen pressure is performed because of the specific etchant used to remove a thick oxide layer.

In contrast, the Okumura patent discloses a very different mechanism. Specifically, an Mg-doped p-type GaN dyed layer 9, a cladding layer 10 and a GaN contact layer 11 are annealed in a nitrogen atmosphere to allegedly reduce the Mg-doped p-type layers. What is important to note from column 8, particularly lines 47-59, is that the resultant annealed wafer is partially etched to form the mesa structure of the contact layer 11 relative to the contact layer 11 using normal photolithographic and dry etching methods. The contact layer 11 and the cladding layer 10 are also partially etched by the same photolithographic and dry etching method to create a ridge structure. An SiO_2 insulating film 14 "is formed on the side walls of the ridge and on the surface of the p-type layer except for the top of the ridge as a current blocking layer."

It is important to note in this instance that there is no oxide layer on the contact layer 11 and therefore it would not be necessary first etch a non-existent

thick oxide layer on the contact area, as is done in the Rennie patent, and therefore not appropriate to form a thin and pure oxide layer to extract F atoms, particularly since the use of an HF etchant is not used. Therefore there would be no apparent reason to employ the F atom removal system disclosed in the Rennie patent in a Okumura device. There simply would be no reason to modify the Okumura process to include the Rennie steps insofar as no oxide layer is formed on the contact layer.

Similarly, there would be no reason to modify the Rennie method in light of the Okumura patent insofar as the Rennie patent uses a mechanism for removing residual fluorine to eliminate an adverse factor in the mechanism of carrier conduction. There is no indication that this process performs less than well. Further, there is no reason to believe that adding an annealing step in a nitrogen atmosphere would improve the resulting device. It must be remembered that the HF etch step (and the consequent need for an ambient oxygen anneal step) is necessitated by the thick oxide on the contact region. If one were to assume that an ambient nitrogen anneal step was desirable, then there would not be a thick oxide that needed to be removed. Stated differently, while the process of the Rennie patent and the process of the Okumura patent may be useful, there is no reason provided in the prior art to do both. The use of one seems to eliminate the need for the other.

Additionally, the recitations of claims 2 and 14, which recite details of the first and second annealing steps, are proposed to be added to independent claims 1 and 13 to further remove the presently claimed invention from the applied art. Specifically, it is respectfully submitted that for the reasons given above, and for the additional recitations of "performing first annealing on the resultant structure in a nitrogen atmosphere after the p-type compound semiconductor layer is formed; and

performing second annealing on the first annealed resultant structure in an oxygen atmosphere", the applied art does not teach or suggest the present invention.

It is believed that with this amplified explanation, the Office will agree that the rejection should be withdrawn. Notice to that effect is respectfully requested.

Respectfully submitted,

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